

## NIEHS Responds to World Trade Center Attacks

The buildings have fallen. The worst of the fires are out. But environmental health hazards still exist in and around the ruins of the World Trade Center following the attacks of 11 September 2001. Workers at Ground Zero toil in a dangerous environment. They and others exposed to dust and fumes in the wake of the building collapse and fires may suffer adverse health effects for years to come. The NIEHS is playing a role in addressing these threats through four of its ongoing programs—the Worker Education and Training Program (WETP), the Environmental Health Sciences (EHS) Centers Program, the Children's Environmental Health and Disease Prevention Research Centers Program, and the Superfund Basic Research Program.

### Worker Education: A Crucial First Step

Several thousand workers are involved in demolition and cleanup work at Ground Zero, work that will continue for as long as a year. Besides the routine dangers involved in cutting and removing construction debris, workers may also be exposed to a host of toxicologic hazards. Specialized training is required to safely work under these conditions.

Hundreds of these workers, including members of the International Union of Operating Engineers, the International

Association of Fire Fighters (IAFF), the International Association of Heat and Frost Insulators and Asbestos Workers, the International Association of Bridge, Structural, Ornamental, and Reinforcing Iron Workers, the Laborers International Union of North America, and the International Brotherhood of Teamsters, have received some training through the WETP. However, Bechtel Corporation, which was hired by New York City to develop a health and safety plan for the World Trade Center site, estimates that all of the workers who will be engaged in demolition and cleanup over the long haul will need additional training in areas such as handling of hazardous waste, lead, and asbestos, and working in confined spaces.

WETP director Chip Hughes visited Ground Zero the first week in October to assess worker safety and health issues. "There is still no organized worker and health training on site," Hughes says. "There is limited personal protection and very little exposure assessment. Nearly six thousand injuries and illnesses have already been reported, ranging from headaches to concussions. If we don't bring a higher level of protection soon, more people could be hurt and more lives lost." The WETP released a preliminary assessment of the potential safety/health hazards and training needs on October 22 at the American Public Health Association

annual meeting (the report is available online at <http://www.wetp.org/>).

The institute's first goal in this area is to secure funding needed to provide all workers with the necessary training to conduct their work safely. The NIEHS has awarded a total of \$440,000 to five organizations, including the Laborers/Associated General Contractors Education and Training Fund, the University of Medicine and Dentistry of New Jersey (UMDNJ), the IAFF, the International Union of Operating Engineers, and the Center to Protect Workers' Rights. Each of these groups has been working to provide much-needed equipment, resources, sampling, and training to the workers engaged in the World Trade Center cleanup. The NIEHS has also requested an emergency appropriation from the Secretary of Health and Human Services to expedite immediate on-site training and technical assistance through existing cooperative agreements with groups such as the IAFF.

A specific training priority is to reestablish training capacity for the New York City Fire Department hazardous materials (HazMat) teams—many trainers were killed in the building collapse. Other priorities include health and safety training for site cleanup workers, health care and personnel training to support ongoing cleanup and remediation, training and certification in the use of personal protective equipment (such as respirators and suits) in the cleanup effort, weapons of mass destruction training for the HazMat workforce, and cross-training in craft skills, safety, and health for demolition and remediation workers.

### Centers Step In to Help

The NIEHS is also helping develop community outreach and education programs, exposure assessments, and epidemiologic studies of people affected by the September 11 attacks through its funding of environmental health centers in the New York City area. Four EHS centers—UMDNJ, New York University, Columbia University, and the Johns Hopkins Bloomberg School of Public Health—are already engaged in various aspects of community outreach and exposure assessment and are eager to expand these activities. In addition, the Center for Children's Health and the Environment at the Mount Sinai School of Medicine is working with outreach and exposure assessment.

Mount Sinai, New York University, and Columbia are part of the scientific and prevention resources available through the NIEHS Superfund Basic Research Program.



**On dangerous ground.** Nearly six thousand illnesses and injuries have been reported to date among rescue workers in the wake of the World Trade Center attacks. Studies now under way are investigating what the workers are being exposed to at the work site and may help avoid even more environmental health effects among both workers and residents.

While no additional Superfund monies have been available to contribute to the organizational response to the terrorist attacks, the ongoing capabilities of these centers have been developed through this program.

"The centers represent an incredible resource base that we can call upon in situations like this," says Bill Suk, deputy director for program development within the NIEHS Division of Extramural Research and Training. "They complement each other, they work together well."

On September 21, NIEHS director Kenneth Olden and Allen Dearry, director of the NIEHS centers programs, met with the New York City area center heads in Baltimore, Maryland, to express the institute's appreciation for their response to the national crisis and to discuss coordination of future center efforts. "I emphasized our support for their efforts and announced that the area Environmental Health Sciences centers and hazardous response workers funded under the auspices of the NIEHS would be provided supplemental funds for their work," Olden says. "I also emphasized how important it is for the centers to work together in a coordinated fashion." The NIEHS has awarded each of the four New York City area EHS centers \$50,000 to support activities initiated in response to the World Trade Center attacks.

### Where to Begin?

Dearry cites three goals for the centers, the first being to identify which environmental toxicants workers and members of the public have been and may yet be exposed to as a result of the collapse and burning of the World Trade Center. "We know there is asbestos in the debris, but there may be other [toxicants] we don't know about," Dearry says. "We can reconstruct what people may have been exposed to by identifying all the source material that was in the World Trade Center offices and doing the same for the airplanes that hit the towers. Then we can model what happens to these materials in an explosion, fire, and building collapse. We also can model where the smoke plume from the fires traveled in the days following the attack." Such reconstruction helps in examining the distribution of potentially hazardous agents and will inform future epidemiologic studies.

Paul Lioy, associate director of the Environmental and Occupational Health Sciences Institute at Rutgers and UMDNJ and an expert on dust analysis, will be coordinating the exposure assessment work among the centers. He is confident that the centers can achieve the goals that have been set forth. "Our ability to conduct exposure studies has greatly improved over

the last twenty years," Lioy says. "This event will entail our bringing to bear our most sophisticated and our simplest tools to address a serious national catastrophe."

A second goal of the centers is to design and conduct epidemiologic studies to track the health of people exposed to the dust and smoke from the World Trade Center collapse and fires. Three studies are currently planned, two of workers and one of mothers and children. Mount Sinai Hospital will coordinate the worker studies, drawing on



**Up in the air.** Air sampling stations have been set up throughout Ground Zero by the U.S. Environmental Protection Agency to determine if there is a continued threat from pollutants released during the terrorist attacks.

its extensive experience in epidemiology and its long history of working with the New York City Department of Health.

The first study will involve conducting physical examinations of workers deemed at highest risk of exposure, an exercise that should take about six months. Johns Hopkins will assist Mount Sinai in developing a questionnaire for use in this examination. UMDNJ and New York University will provide data from their air sampling, and Columbia University will analyze blood samples collected for toxic contaminants and adducts.

The second study will involve constructing a registry of all workers involved in the rescue and cleanup effort, where they worked, and what they were exposed to. The study is expected to take at least one year.

The third study, conducted in conjunction with the Mailman School of Public Health at Columbia University, will enroll a group of mothers who were pregnant on

September 11 and exposed to smoke and dust from the World Trade Center fires and collapse. Researchers will follow the health of the mothers and their babies for up to five years to measure possible effects of exposure to contaminants.

Philip Landrigan, chairman of the Department of Community and Preventive Medicine at Mount Sinai, will be coordinating the epidemiologic studies. "Conducting these studies will be a real challenge, given the complexity of the events surrounding the collapse and fire at the World Trade Center," Landrigan says. "The high temperatures of the fires, the complexity of the materials—these are things we've never encountered before. We'll never know completely what the range of exposures was, but we can learn a great deal."

A third goal of the centers programs is to provide community outreach and education. The Center for Environmental Health in Northern Manhattan (at the Mailman School of Public Health) and New York University have already conducted community forums addressing environmental health aspects of the World Trade Center attacks, as well as issues of bioterrorism. At an October 18 presentation and question-and-answer session, 400 community members came to hear local health care professionals discuss the possible health risks arising from the attacks, as well as research being done on these risks and possible remedies.

The Northern Manhattan Center's Exposure Assessment Core is working with Johns Hopkins to conduct exposure assessments of Teamsters hauling debris from Ground Zero. Drivers were given personal monitors to record exposure to various pollutants. The center's Respiratory Disorders Research Core is also seeking a grant to study apartments suffering water damage after the blast for the presence of mold spores, and a grant to study lung function of policemen exposed to airborne pollutants in and around Ground Zero. "Our center has expertise in a wide range of areas that should be able to provide information about long-term health effects resulting from this tragedy," says Regina Santella, director of the Northern Manhattan Center.

Olden states that while some programs and resources are already in place, additional resources will be needed to fully address the long-term consequences of the disaster. The NIEHS and the two centers programs are currently seeking this from both government and foundations. "NIEHS's ongoing role is a combination of cheerleader, fundraiser, moderator, marketer, and strategic planner," Olden says.

—John S. Manuel